

WHAT IS CLAIMED IS:

1. An optical filter comprising:

a first chirped Bragg grating including a first input/output end and a second input/output end;

a second chirped Bragg grating of the same structure as said first chirped Bragg grating, including a third input/output end of the same structure as said first input/output end of said first chirped Bragg grating and a fourth input/output end of the same structure as said second input/output end of said first chirped Bragg grating; and

a circuit including an input port and an output port, wherein said circuit receives a first optical signal via said input port and brings said first optical signal to said first input/output end of said first chirped Bragg grating, said circuit receives a second optical signal which is produced by reflecting at least one wavelength component of said first optical signal from said first chirped Bragg grating and brings said second optical signal to said fourth input/output end of said second chirped Bragg grating, and said circuit receives a third optical signal which is produced by reflecting said second optical signal from said second chirped Bragg grating and outputs said third optical signal via said output port.

2. The optical filter according to Claim 1, wherein said first optical signal is a wavelength division multiplexed optical signal.

3. The optical filter according to Claim 1, wherein said circuit comprises a first three-port optical circulator and a second three-port optical circulator;

said first three-port optical circulator including a first port coupled to said input port, a second port coupled to said first input/output end of said first chirped Bragg grating, and a third port from which said second optical signal is output;

said second three-port optical circulator including a fourth port coupled to said third port of said first three-port optical circulator, a fifth port coupled to said fourth input/output end of said second chirped Bragg grating, and a sixth port coupled to said output port.

4. The optical filter according to Claim 1, wherein said circuit comprises a four-port optical circulator including a first port coupled to said input port, a second port coupled to said first input/output end of said first chirped Bragg grating, a third port coupled to said fourth input/output end of said second chirped Bragg grating, and

a fourth port coupled to said output port. .

5. The optical filter according to Claim 1, wherein said first input/output end of said first chirped Bragg grating and said third input/output end of said second chirped Bragg grating are long wavelength ends, while said second input/output end of said first chirped Bragg grating and said fourth input/output end of said second chirped Bragg grating are short wavelength ends.

6. The optical filter according to Claim 1, wherein said first input/output end of said first chirped Bragg grating and said third input/output end of said second chirped Bragg grating are short wavelength ends, while said second input/output end of said first chirped Bragg grating and said fourth input/output end of said second chirped Bragg grating are long wavelength ends.

7. The optical filter according to Claim 1, further comprising:

a first termination coupled to said second input/output end of said first chirped Bragg grating, which does not reflect any optical signal; and

a second termination coupled to said third input/output end of said second chirped Bragg grating,

which does not reflect any optical signal. .

8. The optical filter according to Claim 1, further comprising:

a port coupled to said second input/output end of said first chirped Bragg grating, from which wavelength components of said first optical signal that have passed through said first chirped Bragg grating is output; and

a termination coupled to said third input/output end of said second chirped Bragg grating, which does not reflect any optical signal.

9. The optical filter according to Claim 1, further comprising:

a termination coupled to said second input/output end of said first chirped Bragg grating, which does not reflect any optical signal; and

a port coupled to said third input/output end of said second chirped Bragg grating, to which a fourth optical signal is input;

wherein said circuit outputs a multiplexed optical signal including said third optical signal and said fourth optical signal via said output port.

10. An optical filter comprising:

a first chirped Bragg grating including a first input/output end and a second input/output end;

a second chirped Bragg grating of the same structure as said first chirped Bragg grating, including a third input/output end of the same structure as said first input/output end of said first chirped Bragg grating and a fourth input/output end of the same structure as said second input/output end of said first chirped Bragg grating;

a first circuit including a first input port and a first output port, wherein said first circuit receives a first optical signal via said first input port and brings said first optical signal to said first input/output end of said first chirped Bragg grating, said first circuit receives a second optical signal which is produced by reflecting at least one wavelength component of said first optical signal from said first chirped Bragg grating and brings said second optical signal to said fourth input/output end of said second chirped Bragg grating, and said first circuit receives a third optical signal which is produced by reflecting said second optical signal from said second chirped Bragg grating and outputs said third optical signal via said first output port; and

a second circuit including a second input port and a second output port, wherein said second circuit receives

a fourth optical signal via said second input port and brings said fourth optical signal to said third input/output end of said second chirped Bragg grating, said second circuit receives a fifth optical signal which is produced by reflecting said fourth optical signal from said second chirped Bragg grating and brings said fifth optical signal to said second input/output end of said first chirped Bragg grating, and said second circuit receives a sixth optical signal which is produced by reflecting said fifth optical signal from said first chirped Bragg grating and outputs said sixth optical signal via said second output port;

wherein said second circuit outputs wavelength components of said first optical signal which have passed through said first chirped Bragg grating via said second output port together with said sixth optical signal.

11. The optical filter according to Claim 10, wherein said first optical signal is a wavelength division multiplexed optical signal.

12. An optical filter comprising:

a first chirped Bragg grating including a first input/output end and a second input/output end;

a second chirped Bragg grating of the same structure

as said first chirped Bragg grating, including a third input/output end of the same structure as said first input/output end of said first chirped Bragg grating and a fourth input/output end of the same structure as said second input/output end of said first chirped Bragg grating;

a third chirped Bragg grating of the same structure as said first chirped Bragg grating, including a fifth input/output end of the same structure as said first input/output end of said first chirped Bragg grating and a sixth input/output end of the same structure as said second input/output end of said first chirped Bragg grating;

a first termination coupled to said third input/output end of said second chirped Bragg grating, which does not reflect any optical signal;

a second termination coupled to said sixth input/output end of said third chirped Bragg grating, which does not reflect any optical signal;

a first circuit including a first input port and a first output port, wherein said first circuit receives a first optical signal via said first input port and brings said first optical signal to said first input/output end of said first chirped Bragg grating, said first circuit receives a second optical signal which is produced by

reflecting at least one wavelength component of said first optical signal from said first chirped Bragg grating and brings said second optical signal to said fourth input/output end of said second chirped Bragg grating, and said first circuit receives a third optical signal which is produced by reflecting said second optical signal from said second chirped Bragg grating and outputs said third optical signal via said first output port; and

a second circuit including a second input port and a second output port, wherein said second circuit receives a fourth optical signal via said second input port and brings said fourth optical signal to said fifth input/output end of said third chirped Bragg grating, said second circuit receives a fifth optical signal which is produced by reflecting said fourth optical signal from said third chirped Bragg grating and brings said fifth optical signal to said second input/output end of said first chirped Bragg grating, and said second circuit receives a sixth optical signal which is produced by reflecting said fifth optical signal from said first chirped Bragg grating and outputs said sixth optical signal via said second output port;

wherein said second circuit outputs wavelength components of said first optical signal which have passed through said first chirped Bragg grating via said second



output port together with said sixth optical signal.

13. The optical filter according to Claim 12, wherein said first optical signal is a wavelength division multiplexed optical signal.